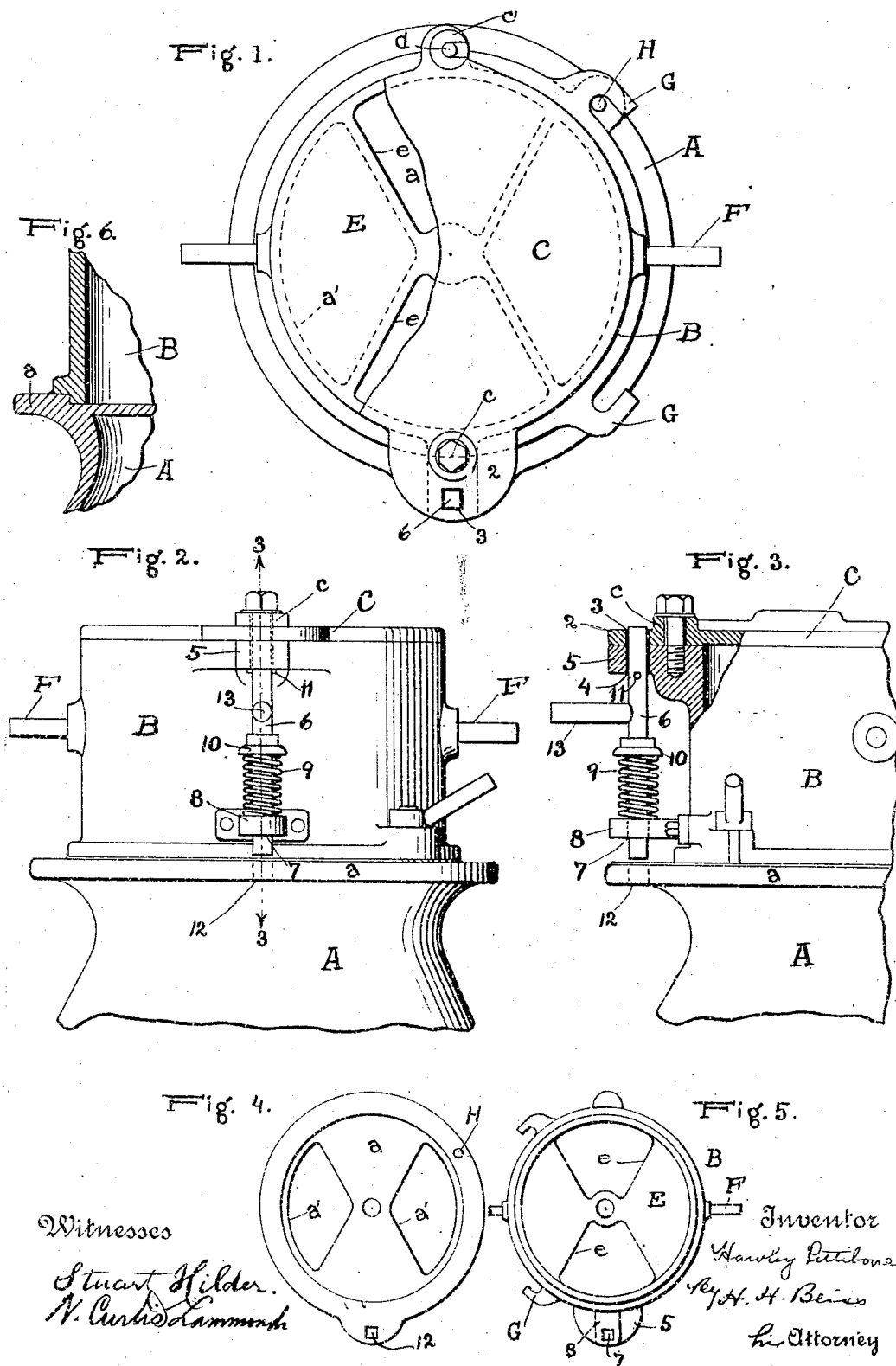


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H. PETTIBONE.
CHARGING DEVICE FOR GAS PRODUCERS.

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Witnesses

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UNITED STATES PATENT OFFICE.

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CHARGING DEVICE FOR GAS-PRODUCERS.

No. 891,859.

Specification of Letters Patent.

Patented June 30, 1908.

Application filed September 8, 1906. Serial No. 333,856.

To all whom it may concern:

Be it known that I, HAWLEY PETTIBONE, a citizen of the United States, residing at Cudahy, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Charging Devices for Suction Gas-Producers, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to charging hoppers for suction gas producers. Such hoppers are usually provided with bottoms having holes adapted to register with apertures or holes in the feeding end of the fuel magazine of the producer furnace, and with tight-fitting closures or covers. The hopper is so supported that it may be rotated to a limited extent in order to bring the openings in the bottom into register with those in the end of the fuel magazine when it is desired to feed the furnace, and to carry them out of register, thereby closing the openings into the furnace chamber, when feeding is not desired. It is important that there should never be a direct opening or communication between the external air and the interior of the furnace, as such opening would result in dilution of the gas delivered from the producer, and render liable an explosion in the furnace or producer, owing to the formation of an explosive mixture of air with the inflammable gases being produced.

My invention has for its object to produce a special locking mechanism for a charging hopper arranged to prevent the simultaneous opening of the cover or closure of the hopper proper, and the communicating passages between the hopper and fuel chamber of the producer or furnace.

In the accompanying drawings—Figure 1 is a top or plan view of a device embodying my invention, part of the cover being broken away. Fig. 2 is a side view of the same; and Fig. 3 is an elevation, parts being in section taken on the line 3—3 of Fig. 2. Fig. 4 is a plan view of the fuel magazine with the hopper detached; Fig. 5 is a bottom plan view of the hopper detached. Fig. 6 is a fragmentary sectional view of the lower part of the hopper and the upper part of the producer with an aperture in the bottom of the hopper in alignment with the cover plate of the producer.

In these drawings A represents the upper

portion of the producer furnace, wherein there is charged the fuel from which the gas is made. The upper end of this chamber is closed by a cover plate *a* through which are a number of openings *a'*.

The feed or charging hopper is designated as a whole by B. It has a close-fitting cover C pivoted at *c* to the walls of the hopper. Upon this pivot the cover is adapted to swing, so that the hopper may be opened for filling with fuel. When in closed position a catch *c'* carried by the cover engages with a pin or lug *d* and holds the cover tightly in place. The hopper is provided with a bottom formed of a plate E, in which are formed a number of apertures *e* adapted to be brought into register with the openings *a'* in the cover plate *a* of the producer furnace.

The hopper is adapted to rest upon the upper end of the producer and to be partially rotated thereupon, in the usual manner, to bring the openings *e a'* into register, or to bring such openings opposite to the solid unperforated parts of the plates *a, E*, respectively as the hopper is turned. To facilitate these rotary movements of the hopper it is provided with handles F, and with lugs G—G, adapted to engage with a stationary pin H projecting from the producer, which limits its movements and determines the position of the hopper.

The parts thus far described may be of usual construction, and are not in themselves novel with me.

2 represents a lug projecting from the edge or periphery of the cover C of the hopper, its location being preferably contiguous to the pivot *c*. In this lug there is formed an aperture 3 that is adapted to register with an aperture 4 formed in the part 5 of the hopper. This latter part may be a lug or a rim or flange extending outward from the side wall of the hopper.

6 is a sliding bolt mounted in the aperture 4 and in an aperture 7 formed in a bracket or lug 8 extending out from the wall of the hopper near its lower end. A spring 9 surrounds the bolt 6, bearing at one end against the lug 8, and at its other end against a collar 10 secured to the stem of the bolt; the spring being normally under tension and tending to lift the bolt, causing its upper end to enter the openings 4 and 3 when they are brought into register.

11 is a stop pin carried by the bolt and ar-

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2 ranged to engage with the underside of the part 5 of the hopper, and thereby limit the upward movement of the bolt.

12 is an aperture formed in a flanged or projecting part of the cover of the furnace or producer, and arranged in line with the bolt 6.

13 is a handle projecting from the bolt by which it is manipulated.

10 The normal positions of the parts of the locking device, comprising the bolt 6, are indicated in Figs. 2 and 3. From this it will be seen that the cover C is tightly closed upon the end of the hopper, in which position the aperture 3 in the cover stands opposite the end of the bolt, so that the spring 9 will slide it into and through such aperture, thus positively locking the cover in closed position. Under these circumstances the hopper is free to be rotated either to open or to close communication with the fuel chamber below, as the lower end of the bolt is lifted so high as to be entirely withdrawn from the aperture 12 in the cover of the producer chamber, and above the top plate *a* thereof.

25 When it becomes desirable to fill the hopper with fuel it is necessary to turn the cover upon its pivot to open its upper end. This, however, cannot be done until the bolt 6 is moved to unlock the cover, and this in turn cannot take place until the parts are brought to the position indicated in Fig. 1, that is to say, the hopper as a whole must be rotated until the openings *e* and *a'* are out of register and communication between the hopper and the fuel magazine of the producer is entirely cut off. When in this position the lower end of the bolt,—which it will be understood turns with the hopper,—is brought directly opposite to the aperture 12 in the top plate of the producer. The bolt may now be forced down, compressing the spring 9 carrying its lower end into the aperture 12, and withdrawing its upper end from the aperture 3, the handle 13 being used to effect this movement of the bolt. When the parts assume this position the hopper as a whole is locked against rotation relative to the producer, and the cover of the hopper is free to turn on its pivot. As soon as the cover is turned, even to a slight extent, the aperture 3 is carried out of line with the bolt, so that the latter is held down by the flange or projecting part 2 of the cover, thus maintaining the hopper locked to the producer so long as the cover is moved from the closing position.

From this description, taken in connection with the drawings, it will be seen that it is impossible to simultaneously open the upper end of the hopper, and communication between the hopper and the fuel chamber.

What I claim is—

1. The combination with a furnace or fuel receptacle having a fuel opening, of a charging device having the hopper constructed to

seat over the said feed opening, and having a movable plate connected to said hopper controlling the said opening, a cover or closure for the upper or feed end of the hopper, and a sliding bolt constructed to lock the said plate when moved to one position and the cover or closure when moved to the opposite position, substantially as set forth.

2. The combination with a furnace or fuel receptacle having a feed opening, of a charging device having a hopper constructed to seat over the said feed opening, and having a movable plate for controlling the said opening, a movable cover or closure for the opposite or upper end of the hopper, and a bolt constructed when moved to one position to lock said plate and release said cover or closure, and when moved to its other position to lock the cover or closure and release the plate, substantially as set forth.

3. The combination with the furnace or fuel receptacle having a feed opening, of a charging device having the hopper adapted to seat over the said feed opening, and having a rotary plate constructed to control the said opening, and communication between the hopper and the furnace or fuel receptacle, a swinging closure or cover for the opposite or upper end of the hopper, a reciprocating bolt arranged when moved in one direction to lock the said plate in position to cut off the communication between the hopper and the furnace or fuel receptacle and to release the closure or cover, and when moved in the other direction to lock the closure or cover and release the said plate, substantially as set forth.

4. The combination with a furnace or fuel receptacle having a feed opening, of a charging device having a hopper constructed to seat over the feed opening, and having a bottom provided with an opening adapted to register with the feed opening in the furnace or fuel receptacle, a swinging cover or closure for the upper end of the hopper, and a sliding bolt mounted in supports carried by the hopper and having its lower end constructed to enter an aperture in its stationary part when depressed, and in an aperture in the cover or closure when elevated, these apertures being so disposed that the bolt stands opposite the former when the hopper is moved to cut off communication between it and the furnace and to stand opposite the latter when the closure is in position to close the hopper, substantially as set forth.

5. The combination with a furnace or fuel receptacle having a feed opening, of a charging device having a hopper constructed to seat over said feed opening, and having a plate which controls the communication between the hopper and the fuel receptacle of the furnace, a cover or closure for the opposite end of the hopper, the closure being pro-

vided with an opening 3, a sliding bolt, the upper end of which is constructed to enter the aperture 3 and lock the closure when the latter is set over the hopper, a spring for moving the bolt upward, and a receiver for the lower end of the bolt constructed to stand opposite thereto when the hopper plate is in position to cut off communication between the hopper and the spring, substantially as set forth.

6. The combination with a furnace or fuel receptacle having a feed opening, of a charging device having a hopper constructed to set over the feed opening, and having a movable plate arranged to control the said opening, a cover or closure for the other end of the hopper, a bolt for alternately locking the said plate and the cover or closure, and keepers for the opposite ends of the bolt, one being carried by the closure and the other being for locking said plate, the keeper in the closure being constructed to come opposite the upper end of the bolt when the closure is over the hopper, and that for locking the plate coming opposite the lower end of the bolt when the communication is cut off between the hopper and the fuel chamber, the closure being arranged to hold the bolt in position to lock said plate when the upper end of the hopper is open, substantially as set forth.

7. The combination of the furnace or fuel receptacle having a feed opening, the movable feed hopper mounted on said receptacle and having an outlet opening adapted to be moved into and out of registry with the feed opening of said receptacle, a movable cover for the hopper and a locking device constructed, in one of its positions, to lock the hopper and release the cover and in another position to release the hopper and lock the cover, substantially as set forth.

8. The combination of the furnace or fuel receptacle having a feed opening, the movable feed hopper mounted on said receptacle and having an outlet opening adapted to be moved into and out of registry with the feed opening of said receptacle, a movable cover for the hopper and a locking device constructed to lock the hopper with respect to the receptacle when the cover is released and to lock the cover with respect to the hopper when said hopper is released, substantially as set forth.

9. The combination of the furnace or fuel receptacle having a feed opening, the movable feed hopper mounted on said receptacle and having an outlet opening adapted to be moved into and out of registry with the feed opening of said receptacle, a movable cover for the hopper, a locking device constructed to lock the cover in its closed position, also to lock the hopper in position with its outlet opening out of registry with the receptacle feed opening, and means to prevent move-

ment of the locking device to release the cover when the hopper outlet is open or to release the hopper when the cover is open, substantially as set forth.

10. The combination of the furnace or fuel receptacle having a feed opening, the movable feed hopper mounted on said receptacle and having an outlet opening adapted to be moved into and out of registry with the feed opening of said receptacle, a movable cover for the hopper, a locking device mounted on the hopper and constructed to lock the cover in its closed position, also to lock the hopper in position with its outlet opening out of registry with the receptacle feed opening, and means to prevent movement of the locking device to release the cover when the hopper outlet is open or to release the hopper when the cover is open, substantially as set forth.

11. The combination of the furnace or fuel receptacle having a feed opening, a movable feed hopper mounted on said receptacle and having an outlet opening adapted to be moved into and out of registry with the feed opening of said receptacle, a movable cover for the hopper, a locking bolt or latch movably mounted on the hopper and constructed to lock the cover in its closed position, also to lock the hopper in position with its outlet opening out of registry with the receptacle feed opening, and means to prevent movement of the locking device to release the cover when the hopper outlet is open or to release the hopper when the cover is open, substantially as set forth.

12. The combination of the furnace or fuel receptacle having a feed opening, a movable feed hopper mounted on said receptacle and having an outlet opening adapted to be moved into and out of registry with the feed opening of said receptacle, a movable cover for the feed hopper, a locking bolt or latch movably mounted on the hopper and constructed to lock the cover in its closed position, also to lock the hopper in position with its outlet opening out of registry with the receptacle feed opening, means carried by the cover to prevent movement of the bolt to release the hopper when the cover is open, and means carried by the receptacle to prevent movement of the bolt to release the cover when the hopper outlet is open, substantially as set forth.

13. The combination of the furnace or fuel receptacle having a feed opening and a locking recess, the movable feed hopper mounted on said receptacle and having an outlet opening adapted to be moved into and out of registry with the feed opening of said receptacle, a movable cover for the hopper having a locking recess, a locking bolt or latch movably mounted on the hopper and adapted, when the hopper is in position to close the receptacle feed opening, to engage the locking recess of said receptacle and, when the cover is in

closed position, to engage the locking recess of said cover, means carried by the cover to prevent movement of the bolt or latch to release the hopper when the cover is open, and means carried by the receptacle to prevent movement of the bolt or latch to release the cover when the receptacle feed opening is open, substantially as set forth.

14. The combination of a furnace or fuel receptacle having a feed opening and a flange with a locking recess, a movable feed hopper mounted on said receptacle and having an outlet opening adapted to be moved into and out of registry with the feed opening of said receptacle, a movable cover for the hopper having a flange with a locking recess, a locking bolt or latch movably mounted on the hopper and constructed at one end to engage the locking recess of the receptacle and at its other end to engage the locking recess of the cover flange, the former flange being disposed so as to prevent movement of the bolt to release the cover when the hopper is in position to open the receptacle feed opening, and the latter flange being disposed so as to prevent movement of the bolt to release the hopper when the cover is open, substantially as set forth.

15. The combination of the furnace or fuel

receptacle having a feed opening in its upper end and a bolt keeper, the movable feed hopper mounted on said receptacle and having an outlet opening adapted to be moved into and out of registry with the feed opening of said receptacle, a movable cover for the hopper having a bolt keeper, a reciprocable bolt mounted on the hopper so as to have its lower end brought into alinement with the keeper of the receptacle when the hopper is in position to close the receptacle feed opening, and having its upper end disposed to engage the keeper of the cover when the latter is closed, a flange on the cover constructed to engage the bolt to prevent its withdrawal from the bolt keeper of the receptacle when said cover is open, and a flange on the receptacle constructed to engage the bolt to prevent its withdrawal from the bolt keeper of the cover when the hopper outlet and receptacle opening are in alinement, substantially as set forth.

In testimony whereof I affix my signature, in presence of two witnesses.

HAWLEY PETTIBONE.

Witnesses:

F. G. BECKER,
L. F. SNYDER.